

Serial No. 10/697,626

Filing Date: October 30, 2003

Amendments to the Claims:

The listing of Claims will replace all prior versions and listings of the Claims in the application:

Listing of Claims

1. (Currently Amended) A loudspeaker system for receiving an incoming electrical signal and transmitting an acoustical signal, the loudspeaker system comprising:

a driver circuit having an input with an input impedance, wherein the driver circuit comprises a first passive filter coupled to a first speaker driver and a second passive filter coupled to a second speaker driver; and

an audio power amplifier having an input and an output, wherein the audio power amplifier includes a current-feedback amplifier configured to create a desired impedance at the output that is between about 25 percent and about 400 percent of the input impedance of the driver circuit,

the power amplifier comprising a current monitor operable to sense an output current at the output, and a feedback circuit coupled with the current monitor, the feedback circuit operable to generate a feedback signal to create the desired output impedance;

wherein the input of the audio power amplifier receives the incoming electrical signal, and the output of the audio power amplifier is coupled to the input of the driver circuit.

2. (Original) The loudspeaker system of claim 1, wherein the first passive filter comprises an inductor and a capacitor.

3. (Original) The loudspeaker system of claim 1, wherein the second passive filter comprises an inductor and a capacitor.

4. (Original) The loudspeaker system of claim 1, wherein the first passive filter comprises a Butterworth filter.

5. (Original) The loudspeaker system of claim 4, wherein the first passive filter comprises a fourth-order filter.

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6. (Original) The loudspeaker system of claim 1, wherein the first passive filter has an output characteristic termination impedance, the first speaker driver has a cold impedance, and the output characteristic termination impedance of the first passive filter is between about 25 percent and about 400 percent of the cold impedance of the first speaker driver.

7. (Original) The loudspeaker system of claim 6, wherein the second passive filter has an output characteristic termination impedance, the second speaker driver has a cold impedance, and the output characteristic termination impedance of the second passive filter is between about 25 percent and about 400 percent of the cold impedance of the second speaker driver.

8. - 9. (Canceled)

10. (Currently Amended) The loudspeaker system of claim 1, wherein the first speaker driver has a cold impedance of about 4 Ohms, the first passive filter has an output characteristic termination impedance of about 4 Ohms, and the output impedance of the audio power amplifier is between about 1 Ohms and about 16 Ohms.

11. (Currently Amended) The loudspeaker system of claim 10, wherein the second speaker driver has a cold impedance of about 4 Ohms, the second passive filter has an output characteristic termination impedance of about 4 Ohms, and the output impedance of the audio power amplifier is between about 2 Ohms and about 8 Ohms.

12. (Currently Amended) The loudspeaker system of claim 1, wherein the first speaker driver has a cold impedance of about 8 Ohms, the first passive filter has an output characteristic termination impedance of about 8 Ohms, and the output impedance of the audio power amplifier is between about 2 Ohms and about 32 Ohms.

13. (Currently Amended) The loudspeaker system of claim 12, wherein the second speaker driver has a cold impedance of about 8 Ohms, the second passive filter has an output characteristic termination impedance of about 8 Ohms, and the output impedance of the audio power amplifier is between about 4 Ohms and about 16 Ohms.

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14. (Currently Amended) The loudspeaker system of claim 1, further comprising an enclosure, wherein the driver circuit and the ~~audio~~ power amplifier are each affixed to the enclosure.

15. (Currently Amended) A method of constructing a loudspeaker system for receiving an incoming electrical signal and transmitting an acoustical signal, the method comprising:

selecting a first speaker driver having a first cold impedance;

selecting a second speaker driver having a second cold impedance;

constructing a first passive filter having an input and an output;

constructing a second passive filter having an input and an output;

coupling the output of the first passive filter to the first speaker driver so that the input of the first passive filter has a first combined cold impedance;

coupling the output of the second passive filter to the second speaker driver so that the input of the second passive filter has a second combined cold impedance;

forming a passive arrangement of the first speaker driver, the second speaker driver, the first passive filter and the second passive filter by coupling the input of the first passive filter to the input of the second passive filter, where the passive arrangement has an arrangement cold impedance;

constructing an ~~audio~~ power amplifier having an input for receiving said incoming electrical signal and an output,

sensing a current on the output with a current monitor

setting an output impedance of the ~~audio~~ power amplifier with a current feedback circuit included in the ~~audio~~ power amplifier based on the sensed current, where the output impedance is set to be between about 25 percent and about 400 percent of the arrangement cold impedance; and

coupling the output of the ~~audio~~ power amplifier to the input of the first passive filter and to the input of the second passive filter.

16. (Original) The method of claim 15, wherein constructing the first passive filter comprises coupling an inductor to a capacitor

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17. (Original) The method of claim 15, wherein constructing the second passive filter comprises coupling an inductor to a capacitor
18. (Original) The method of claim 15, wherein constructing the first passive filter comprises constructing a Butterworth filter
19. – 20. (Canceled)
21. (Original) The method of claim 15, wherein selecting the first speaker driver comprises selecting a first speaker driver having a cold impedance of about 4 Ohms.
22. (Currently Amended) The method of claim 21, wherein constructing an ~~audio~~ power amplifier comprises constructing an ~~audio~~ power amplifier where the output has an output impedance that is between about 2 Ohms and about 8 Ohms.
23. (Original) The method of claim 15, wherein selecting the first speaker driver comprises selecting a first speaker driver having a cold impedance of about 8 Ohms
24. (Currently Amended) The method of claim 23, wherein constructing an ~~audio~~ power amplifier comprises constructing an ~~audio~~ power amplifier where the output has an output impedance that is between about 2 Ohms and about 16 Ohms.
25. (Currently Amended) The method of claim 15, further comprising constructing an enclosure, and mounting the first and second passive filters, the first and second speaker drivers, and the ~~audio~~ power amplifier to the enclosure.
26. (Currently Amended) A loudspeaker system for receiving an incoming electrical signal and transmitting an acoustical signal, the loudspeaker system comprising:
an ~~audio~~ amplification means for receiving said incoming electrical signal at an input and providing an amplified signal that is a function of the incoming electrical signal at an output that has an output impedance;

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a first filter means for receiving the amplified signal at an input and providing a first filtered signal that is a function of the amplified signal at an output;

a second filter means for receiving the amplified signal at an input and providing a second filtered signal that is a function of the amplified signal at an output;

a first speaker driver coupled to the output of the first filter means, where the first speaker driver has a first cold impedance and is driven by the first filtered signal; and

a second speaker driver coupled to the output of the second filter means, where the second speaker driver is driven by the second filtered signal;

where the ~~audio~~ amplification means comprises a current-feedback amplifier configured to set the output impedance of the ~~audio~~ amplification means to be between about 25 percent and about 400 percent of the first cold impedance,

the amplification means further comprising a current monitoring means for monitoring current on the output, and a feedback means for generating a feedback signal to set the output impedance as a function of the monitored current.

27. (Canceled)

28. (Previously Presented) The loudspeaker system of claim 26, wherein the current-feedback amplifier has an output impedance between about 2 Ohms and about 16 Ohms.

29. (Original) The loudspeaker system of claim 26, wherein the first filter means has an output characteristic termination impedance, the first speaker driver has a cold impedance, and the output characteristic termination impedance of the first filter means is between about 25 percent and about 400 percent of the cold impedance of the first speaker driver.

30. (Canceled)

31. (Currently Amended) A loudspeaker system for receiving an incoming electrical signal and transmitting an acoustical signal, the loudspeaker system comprising:

a driver circuit having a cold input impedance;

a current feedback ~~audio~~ amplifier comprising a current monitor and a feedback circuit, where the current monitor is operable to sense a current at an output of the current feedback

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~~audio~~ amplifier and the feedback circuit is operable as a function of the sensed current to generate a feedback signal to create an output impedance of the current feedback ~~audio~~ amplifier that is substantially matched to the cold input impedance of the driver circuit; ~~and~~

~~_____ a speaker enclosure housing the driver circuit and the current feedback audio amplifier;~~

~~_____ wherein the current feedback audio amplifier receives the incoming electrical signal and drives the driver circuit.~~

32. (Currently Amended) A method of operating a loudspeaker system that converts an incoming electrical signal to an acoustical signal, the method comprising:

operating a driver circuit in a temperature range so that an input impedance of the driver circuit is in an operational range;

configuring an output impedance of a current-feedback ~~audio~~ amplifier with a feedback signal, to be within the operational range of the input impedance of the driver circuit, where the feedback signal is generated based on an output current of the current-feedback ~~audio~~ amplifier that is being monitored with a current monitor;

amplifying the incoming electrical signal with the current-feedback ~~audio~~ amplifier to produce a driving electrical signal; and

driving the driver circuit with the driving electrical signal.

33. - 34. (Canceled)

35. (Currently Amended) The loudspeaker system of claim 1, where the ~~audio~~ power amplifier includes a summer configured to sum the incoming electrical signal and the ~~the~~ ^{[[a]]} feedback signal ~~generated with the audio power amplifier~~ to form the desired impedance at the output.

36. (Canceled)

37. (Currently Amended) The loudspeaker system of claim 1 ~~36~~, where the feedback circuit is configured with a transfer ratio that is ~~about~~ the same as the desired impedance.

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38. (Currently Amended) The method of claim 15, where setting an output impedance of the audio power amplifier with a current feedback circuit comprises summing the incoming electrical signal with a feedback signal generated by the feedback circuit to create the output impedance.

39. (Currently Amended) The loudspeaker system of claim 26, where the current-feedback audio amplifier comprises ~~a current monitor operable to sense a current at the output, a feedback circuit operable to generate a feedback signal based on the sensed current, and~~ a summer operable to sum the incoming electrical signal and the feedback signal to set the output impedance.

40. (Previously Presented) The method of claim 32, where amplifying the incoming electrical signal comprises summing the feedback signal and the incoming electrical signal to produce the driving electrical signal.

41. (New) The loudspeaker system of claim 31, further comprising a speaker enclosure housing the driver circuit and the current feedback amplifier.

42. (New) The loudspeaker system of claim 31, where the current feedback amplifier is operable to receive the incoming electrical signal and drive the driver circuit.